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ABSTRACT

In an effort to insure that medical technologists prepared for their careers through nontraditional educational offerings are at least as competent as those graduated from traditional programs, the American Society for Medical Technology has defined the term "nontraditional education" for its own use, categorized the educational mechanisms that could be termed nontraditional, and determined the nontraditional paths that meet society criteria. Nontraditional education is defined as any approach that differs from a lecture, laboratory, and clinical experience model or any medical technology curriculum differing from the so-called "3 + 1." Two sets of criteria for inclusion in the nontraditional category are outlined. The first is of those for evaluating educational offerings as an administrative unit, and consists of: a statement of goal, learning objectives, an outline or syllabus, authoritative professional content document (certifiable materials), a statement of didactic approach, a designated coordinator who is a content expert with specific qualifications, laboratory resources made available to students, library resources, consulting personnel, evaluation components, and a record of learner achievements. Criteria for equivalency outcomes, the second set, includes: an evaluating agency, an evaluation coordinator, coordinator qualifications, content objectives with basis in an authoritative professional content document or documents, evaluation instruments (cognitive, psychomotor, and affective), minimum performance levels, and agency records. (MSE)

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WHAT IS NON-TRADITIONAL EDUCATION?

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ABSTRACT

Professional societies which represent Medical Technology are becoming increasingly aware of the need for a profession-based competence assurance system which provides for the evaluation of clinical laboratories and clinical laboratory professionals. Among many quality-related issues confronting the American Society for Medical Technology (ASMT) is the large number of practitioners who have achieved entry-level competence through "non-traditional" approaches. While the term "non-traditional" is vague, it includes at least such educational offerings as proprietary schools, military specialist's courses, on-the-job training, career ladder articulation, Bachelor's degree in general sciences, and courses offered in formal institutions which incorporate unusual aspects. The Topic Study Group on Non-traditional Education was formed by the ASMT Scientific Assembly to define "non-traditional" and to determine its equivalency to formal education mechanisms. The group provides here a definition of and examples for non-traditional educational offerings and some means to insure that practitioners prepared through these alternative paths are at least as competent as those graduated from traditional programs.

AUTHORITY

In 1979 the ASMT House of Delegates adopted the Philosophy for a Competence Assurance System (7). The Scientific Assembly acted quickly to form the Competence Assurance Council to implement the System. Their goal was to promote "high standards of laboratory practice," (7), resulting in quality control of laboratory data, through, among other means, the evaluation and certification of educational mechanisms and their products, entry level laboratory personnel.

Because a large proportion of the clinical laboratory work force joins the profession through non-formal paths, a system that certifies only formal or traditional offerings would be partially circumvented (5). Consequently, one component of competence assurance is assessment of "non-traditional" education and its products or graduates. Therefore, the Council and the Assembly commissioned a Topic Study Group (hereinafter referred to as the Group) in October of 1979 to examine "non-traditional" education. The group received the following mandate:

1. Categorize those educational mechanisms which could be termed "non-traditional."
2. Determine those non-traditional paths which meet pre-determined criteria.
3. Publish findings and obtain the appropriate acceptance.

The group was expected to deliberate during 1980 and 1981 and prepare a final report to the Assembly and the Council in June of 1981. This is a summary of the final report.

PROCESS

The Group was assembled by correspondence in December of 1979. Members were selected to represent several types of non-traditional education. Most were educators participating in career ladder programs, proprietary schools, military laboratory specialist's course, auto-tutorials, and on-the-job training. All members had had experience in the design of competence-based curricula and all had had experience with imposing new models of education upon existing systems.

From December, 1979 through June of 1980 the Group communicated only through correspondence, each member individually responding to the comments of others through the chair who coordinated the mailings. In June, one meeting was held, in conjunction with the annual meeting of ASMT, followed by which several additional mailings served to complete the project. In general, the issues of the first mandate were considered before the June meeting, and the issues of the second during and after.

ARRIVING AT A DEFINITION

Figure 1 is a list of modes or types of educational offerings which could be called non-traditional. This grew from a mild but dynamic polarity within the Group. To define "non-traditional" one must examine a continuum of definitions ranging from the most limiting to the most inclusive (1). Using a formal college education as the representative of "traditional" education the definition could simply be "any course or program preparing entry-level technologists which does not culminate in a formal degree." At the other extreme

one could use the definition "any course or program which incorporates unusual aspects." This definition would include many offerings provided within traditional institutions as well as outside. In grappling with the continuum, the Group arrived at a definition which was very inclusive:

Non-traditional education includes any approach that differs from a lecture, laboratory, and clinical experience model or any Medical Technology curriculum which differs from the "3 + 1."

Recognizing that an inclusive definition leads to chaos, the Group offers this definition only in tandem with the list of educational modes given in figure 1. Note that "non-traditionalism" includes unusual formatting of courses, or portions of courses such as self-instruction, and use of media; and unusual curricular approaches such as career ladder or specialized degrees, credit for experience, and education in military and proprietary schools (6). The Group feels that the definition and list are both comprehensive and illuminating.

FORMING CRITERIA

The second mandate appears to require the Group to classify and select types of offerings which are acceptable. Recognizing that the variety of non-traditional offerings is infinite, the Group chose instead to generate a list of criteria by which the offering may be judged. Two aspects of criterion preparation are worthy of mention. The first was that no attempt was made to provide content-oriented objectives among the criteria. Such an effort would

duplicate the efforts of other Topic Study Groups, and would extend beyond the scope of the mandate. Instead, criteria should primarily prescribe those administrative requirements that are superimposed upon routinely applied content requirements in non-formal circumstances. Content control is provided for in single criteria which simply refer to the need for authoritative documentation.

The issue of equivalency is more troublesome. To determine whether an offering meets acceptable standards it was concluded that formal educational approaches could serve as the standards. This appears to imply that the formal educational approach is the most desirable approach and that non-traditional educational offerings are being judged strictly upon whether they can match the classroom. In reality quality varies widely in both the traditional and the non-traditional offerings. Furthermore, professional competence is individually pursued and achieved. Therefore, it is important to point out that traditional education is used only because it forms the largest pool of consistent data against which other offerings may be judged. Furthermore, the criteria only provide minimum standards which may be and are likely to be transcended individually or as a group.

The criteria are provided in two lists, figure 2 and figure 3. In the first list are those criteria which may be applied to the evaluation of educational offerings as an administrative unit. These may be modules, courses, or curricula which are relatively formally organized but which may be provided either within or outside of traditional educational institutions. To use this first list a process would be established in which the presenters of

a specific offering would approach the accrediting agency for consideration. The agency would then examine information provided by the presenters and determine the acceptability of the offering. A list of approved offerings would be maintained by the agency. The process would be analagous to accreditation of a school or curriculum, and could proceed prior to placing the offering in service, that is, before there are any graduates or products.

The second list is of criteria to be applied when an individual seeks equivalent credit for participation in some educational process. Use of this set of criteria alone would provide for equivalency without concern for the nature, content, or format of the individual's learning experience. This list provides for two agencies; the first is a formal educational institution which actually grants educational credit for an individual's achievement. Note that this institution must already provide course work in the equivalent subject area in order to grant credit. A second agency is referred to as the advisory agency, whose task it is to make recommendations to a credit-granting institution. This agency would develop and maintain a set of evaluation instruments such as paper and pencil tests, standard performance tests and attitude assessments which serve to evaluate individual competence. The advisory agency would be responsible for the administration of these tests and provision of evaluation data, and would maintain communication with any college or university which could grant credit.

Three models for the use of the criteria are provided by the Group. As stated, the first provides for accreditation of an educational offering, the

second for equivalent credit for individuals who are the products of non-traditional preparation. The third model employs both sets of criteria in tandem. In order for an individual to gain credit both the person's abilities and the educational offering would be examined before there is approval. The use of model one or three will provide for more stringent control of personal and educational qualifications but is sure to limit creativity of non-traditional offerings and result in a high rate of exclusion. The use of model two will permit for the widest range of offerings to gain acceptability but would result in loss of control. Processes that examine traditional offerings typically assess both the educational activity and its product.

COMMENTS:

The Group recommends that a study be undertaken to determine the percentage of clinical laboratory practitioners who enter the profession through non-traditional means. The likelihood exists that the numbers are high enough to render the need for evaluation quite essential. In addition, it has become clear that in the last three years the demand for traditional approaches to medical technology education has diminished while the numbers of members trained through the career laddered approach have assumed significant proportions. It may be that within a few years the forms of education we now call "non-traditional" will be more commonly employed than the formal courses we are now accustomed to.

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means of documentation. The examination must be based upon the predetermined entry-level competencies of the *advisory agency*, clearly defined in behavioral objective format and used consistently by all equivalence-granting institutions. The exam may be designed *de novo* by the agency or obtained from other sources provided it reflects the requirements of the objectives.

8. Evaluation Instrument: Affective.

For evaluation of affective objectives a strategy must be developed based upon the predetermined objectives of the *advisory agency* that are clearly defined in behavioral terms and are used consistently by all equivalence-granting institutions. The evaluation strategy may include assessments of former employers or instructors or the analysis of situation vignettes presented live, on film or videotape, or in writing.

9. Minimum Performance Levels.

For each evaluation instrument it is the responsibility of the coordinator to compute a minimum performance level based upon measurement criteria given in the objectives. The minimum pass level should be an absolute, numerical figure based upon the content and difficulty of individual test items. Determination of minimum pass levels for examinations must involve the work of a committee convened by the coordinator and must be validated with an adequate population before use.

10. Records.

Permanent, retrievable records, available upon the demand of the learner, must be provided by the agency evaluating or granting equivalency.

Figure 3

MODES OF NON-TRADITIONAL MEDICAL TECHNOLOGY EDUCATION

Four-Year Degrees

- Four-year fully integrated BS in Medical Technology
- 2+2 university or college-based BS in Medical Technology
- Post-Baccalaureate program (4+1) with MT clinical year
- Baccalaureate program with work experience
- B.S. in Basic Science
- University-based baccalaureate with no clinical experience
- Specialty-directed B.S., e.g., Clinical Chemistry

Career Ladder Approaches

- Internal MLT-MT articulated approach
- Open articulation MLT-MT approach
- Part-time B.S. in Medical Technology for MLT's

Equivalency-Experience Recognition

- CLEP exams for course credit
- Direct credit for equivalent courses, e.g., military courses
- Equivalency testing for credit for experience
- Credit by equivalency for self-directed study
- Credit for research and publications produced

Education Outside of Usual Universities and Colleges

- Independent study courses
- Proprietary schools
- Military courses

Courses and Curricula With Unusual Aspects

- Self-instructional units
- Self-instruction using media, e.g., slides, tapes, video
- Structured continuing education workshops - traveling, conventions
- Unusual time frames, e.g., evenings, weekends, consecutive rather than concurrent courses
- Modular courses
- Telephone conferences and networks, e.g., "Telinet"
- Courses based on on-the-job clinical experience assignments tailored to student needs
- Retraining for medical technologists

Criteria For Non-traditional Education I:

Model for Educational Offerings

The following criteria may be used to evaluate non-traditional educational offerings in Medical Technology. These are confined to those course/module/or experiential offerings which contribute towards attainment of the entry level of the Medical Technology profession. These are minimal criteria, possession of which indicates that an offering is at least equivalent in quality to a formally constituted course from an accredited university, college, or School of Medical Technology. These criteria are used only to define the acceptability of the offering, and do not provide for measurement of the educational outcomes at the level of the individual learner.

1. Statement of Goal.

A unified educational goal which defines in broad terms the content, the format (or educational approach) and the outcome of the offering must be available to the learner and recorded in official documentation. Such a statement must demonstrate that the offering is confined to a single discipline or set of objectives within a single discipline.

2. Learning Objectives.

A set of competency-based learning objectives which define the content of the offering and which establish student-centered learning outcomes must be provided to the learners and recorded in official documentation. It is likely that any Medical Technology

offering would include objectives of the cognitive, psychomotor and affective domains.

3. Outline or Syllabus.

A content outline or syllabus which describes all the learning experiences in detail including the number of contact hours must be recorded in official documentation and provided for learner use.

This outline may be a part of the Learning Objective document or a separate document keyed to the learning objectives by number.

4. Authority.

Learning Objectives and content outlines must be demonstrably based upon an authoritative professional content document such as the ASMT Body of Knowledge. Each objective must be referenced to at least one authority by footnote or bibliography.

5. Educational Format.

A statement which describes the didactic approach must be recorded in official documentation. This would include a description of cognitive method, such as lecture, discussion, module, individual readings, or tutorial, psychomotor method such as simulated laboratory, exercise or clinical practice, and affective approaches and as discussion or trigger modules.

6. Coordinator.

Any offering must be coordinated by a designated content expert who is available to the learner on a regular basis either through personal interview or two-way telecommunication. This individual is

responsible for the content and objectives and must provide individual supervision of learners to insure that objectives are being met on a day to day basis. Examples of services provided by the content expert may be lectures, discussions, consultation with learners, provision of resources such as additional lecturers, library materials, laboratory materials.

7. Qualifications of the Coordinator.

The Coordinator must be described by an up-to-date Curriculum Vitae, included in official documentation. Such an individual must possess at least a Bachelor's degree in Medical Technology or related laboratory science and must be certified as a Medical Technologist or Clinical Laboratory Scientist or in an associated specialty by a nationally recognized certifying agency such as the NCAMLP, ISCLT, AMT, or ASCP.

8. Laboratory Resources.

A list of laboratory resources such as major supplies, equipment, types and numbers of clinical specimens and physical accoutrements available must be provided to the learners and placed in official documentation. The list should indicate which objectives are supported by each major resource.

9. Library Resources.

A list of major texts, periodicals, reviews, and audio-visuals relative to the educational offering must be provided to the learner and recorded in official documentation. Such materials must be easily accessible to the learner.

10. Consulting Personnel.

A list of individuals immediately available to learners who have demonstrated knowledge within the discipline must be provided to the learner and recorded in official documentation. For each consulting individual a short biographical sketch must be included in the documentation which gives the individual's qualifications. Such individuals may include professional laboratory staff, physician staff, and faculty members.

11. Evaluation.

Any educational offering must provide for evaluation of learner achievements. Paper and pencil tests, keyed to learning objectives, should be administered for cognitive objectives. Practical examinations must be administered for all psychomotor objectives and the results recorded on a checklist or laboratory report form. Examples of evaluation instruments must be provided for evaluation of an offering.

12. Record of Learner Achievement.

Learner performance on evaluation instruments must be officially recorded in permanent documentation and summaries or averages of performance results must be available upon the demand of the learner. Such a summary should be in the form of a transcript or similar permanent document issued by the responsible institution.

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Criteria for Non-traditional Education II:

Individual Outcomes

The following criteria may be used to evaluate non-traditional educational experiences in Medical Technology. These are confined to those course/module/or experiential offerings which contribute towards the attainment of the entry level of the Medical Technology profession. These criteria are used to assess outcomes of non-traditional education as exhibited by the individual who has completed the learning activity and do not evaluate the offering itself. Acceptability is defined as academically equivalent to a course offering of like content in an accredited College or University.

1. The Evaluating Agency.

In order for an institution to grant equivalence for any non-traditional educational offering, that institution must provide a similar pre-existing course or curriculum to which the non-traditional offering contributes. The non-traditional offering thus serves to substitute for an existing course or for a portion of an existing curriculum. The institution must insure that at least 75% of its graduates are educated in the pre-existing (traditional) manner. A separate agency may serve in an advisory capacity, assessing equivalence of course offerings for degree-granting institutions. This agency should maintain a list of approved offerings and establish a time limit for retention of approved status.

2. Evaluation Coordinator.

The advisory agency must have a staff member or consultant who is familiar with the content of the non-traditional course offering under evaluation. The coordinator is responsible for preparation of objectives, evaluation materials, and records. He or she must establish and monitor pass-fail criteria to determine a learner's eligibility for equivalent credit. The coordinator is expected to form a committee to share in these responsibilities. This committee should consist of at least three participants with experience in clinical laboratory science education.

3. Qualifications for Coordinator.

The coordinator must be described by an up-to-date Curriculum Vitae, kept on file by the agency. He or she must possess at least a Master's degree in Education, Medical Technology, or a related laboratory science and must be certified as a Medical Technologist or Clinical Laboratory Scientist or in an associated specialty by a nationally recognized certifying agency such as the NCMLP, ISCLT, AMT or ASCP.

4. Objectives.

Before a non-traditional educational offering may be evaluated by an advisory agency, that agency must possess a set of properly constituted learning objectives which identify the content that must be associated with the designated discipline. Such objectives are to be produced by the Coordinator and his or her selected committee de

novo or procured from pre-existing course documentation where appropriate. Objectives must include the cognitive, psychomotor, and affective domains.

5. Authority.

Objectives must be demonstrably based upon an authoritative professional content document such as the ASMT Body of Knowledge. Reference must be made in each objective to the applicable section in the authority.

6. Evaluation Instrument: Cognitive.

For evaluation of cognitive objectives a written examination must be used. The examination must be based upon the predetermined objectives of the advisory agency which reflect entry-level competencies which are clearly defined in behavioral terms and are used consistently by all equivalence-granting institutions. The exam may be prepared de novo by the agency itself or obtained from other sources.

7. Evaluation Instrument: Psychomotor.

For evaluation of psychomotor objectives a standard practice examination must be developed. Record of the examination may employ a checklist or other written means of documentation. The examination must be based upon the predetermined entry-level competencies of the advisory agency, clearly defined in behavioral objective format and used consistently by all equivalence-granting institutions. The exam may be designed de novo by the agency or obtained from other sources provided it reflects the requirements of the objectives.

8. Evaluation Instrument: Affective.

For evaluation of affective objectives a strategy must be developed based upon the predetermined objectives of the advisory agency that are clearly defined in behavioral terms and are used consistently by all equivalence-granting institutions. The evaluation strategy may include assessments by former employers or instructors or the analysis of situation vignettes presented live, on film or videotape, or in writing.

9. Minimum Performance Levels.

For each evaluation instrument it is the responsibility of the coordinator to compute a minimum performance level based upon measurement criteria given in the objectives. The minimum pass level should be an absolute, numerical figure based upon the content and difficulty of individual test items. Determination of minimum pass levels for examinations must involve the work of a committee convened by the coordinator and must be validated with an adequate population before use.

10. Records..

Permanent, retrievable records, available upon the demand of the learner, must be provided by the agency evaluating or granting equivalency.